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Amendments to the Claims:

This listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims:

Claim 1 (currently amended): A method for fabricating a bi-layer photovoltaic cell, comprising:

mixing a plurality of p-type nanocrystalline semiconductors in a first binder matrix;

forming a thin p-layer comprising the mixed p-type nanocrystalline semiconductors and the first binder matrix;

mixing a plurality of n-type nanocrystalline semiconductors in a second binder matrix;

forming a thin n-layer comprising the mixed n-type nanocrystalline semiconductors and the second binder matrix; and

binding the p-layer and the n-layer to establish contact between at least a portion of the n-type nanocrystalline semiconductors and the p-type nanocrystalline semiconductors at a p-n heterojunction interface,

wherein the p-type mixing further comprises mixing in a plurality of anion additives and wherein the n-type mixing further comprises mixing in a plurality of cation additives, whereby during the binding uncompensated anions are produced proximal to the interface in the p-layer and uncompensated cations are produced proximal to the interface in the n-layer, and wherein an electric field is formed integrally at the interface rather than uniformly across the cell.

Claim 2 (canceled)

Claim 3 (previously presented): The method of claim 1, further including processing the bound p-layer and n-layer to remove mobile counter ions at the p-n heterojunction interface.

Claim 4 (original): The method of claim 1, wherein the binder matrices comprise an epoxy and binding is performed prior to final stages of curing the epoxy.

Claim 5 (currently amended): The method of claim 4, wherein the binding ~~included~~ includes applying heat and pressure to the contacting p-layer and n-layer.

PAGE 5/13 * RCVD AT 10/5/2006 2:12:13 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-5/11 * DNIS:2738300 * CSID:3033847499 * DURATION (mm-ss):01-46

Claim 6 (original): The method of claim 1, wherein the forming of the p-layer further comprises applying the thin p-layer to a flexible electrically conductive substrate and the forming of the n-layer further comprises applying the thin n-layer to a flexible electrically conductive substrate.

Claim 7 (original): The method of claim 1, wherein the p-layer and the n-layer have thicknesses less than about 250 nanometers.

Claim 8 (original): The method of claim 7, wherein the p-type nanocrystalline semiconductors and the n-type nanocrystalline semiconductors comprise single organic crystals less than about 150 nanometers in size.

Claim 9 (previously presented): The method of claim 8, wherein the p-type nanocrystalline semiconductors comprise p-type titanyl phthalocyanine (TiOPc) crystals and the n-type nanocrystalline semiconductors comprise n-type perylene-bis-2-pyridylethylimide (PPyEI) crystals.

Claim 10 (original): A product comprising at least one bi-layer photovoltaic cell formed according to the method of claim 1.

Claim 11 (currently amended): A bi-layer photovoltaic cell, comprising:

a first semiconductor layer comprising a binder, nanocrystals of an n-type semiconductor, and a plurality of spatially bound cations;

a second semiconductor layer contacting the first semiconductor layer comprising a binder, nanocrystals of a p-type semiconductor, and a plurality of spatially bound anions; and

a p-n heterojunction at the contacting interface between the first and second semiconductor layers, wherein the spatially bound cations and anions are proximal to the p-n heterojunction, wherein an electric field is integrally formed with the bi-layer photovoltaic cell at the p-n heterojunction.

Claim 12 (currently amended): The cell of claim 11, further including a first electric contact attached to the first semiconductor layer distal to the p-n heterojunction and a second electric contact abutting the second semiconductor layer distal to the p-n heterojunction.

Claim 13 (original): The cell of claim 11, wherein the n-type and the p-type nanocrystals are smaller than about 150 nanometers and comprise organic crystals.

Claim 14 (original): The cell of claim 11, wherein the binders comprise a polymer matrix.

Claim 15 (original): The cell of claim 14, wherein the polymer matrix comprises an epoxy.

Claim 16 (previously presented): The cell of claim 11, wherein the nanocrystals of the n-type semiconductor comprise a portion of the volume of the first semiconductor layer larger than a portion of the volume of the first semiconductor layer comprising the binder and wherein the nanocrystals of the p-type semiconductor comprise a portion of the volume of the second semiconductor layer larger than a portion of the volume of the second semiconductor layer comprising the binder.

Claim 17 (currently amended): A method of producing a bi-layer organic photovoltaic cell, comprising:

forming a p-layer comprising organic nanocrystals of a p-type semiconductor, a binding matrix, and an anion additive;

forming an n-layer comprising organic nanocrystals of an n-type semiconductor, a binding matrix, and a cation additive;

binding the p-layer and the n-layer to create a p-n heterojunction interface between abutting portions of the p-type semiconductor organic nanocrystals and the n-type semiconductor organic nanocrystals, wherein the anion and cation additives interact to create a dipole or electric field at the p-n heterojunction interface, whereby the dipole or electric field is concentrated at the p-n heterojunction interface rather than dropping uniformly across the bi-layer organic photovoltaic cell.

Claim 18 (original): The method of claim 17, wherein the p-type semiconductor organic nanocrystals comprise greater than about 60 percent of the volume of the p-layer and the n-type semiconductor organic nanocrystals comprise greater than about 60 percent of the volume of the n-layer.

Claim 19 (original): The method of claim 17, wherein the anion additive is substantially uniformly dispersed in the p-layer and comprises a first salt and wherein the cation additive is substantially dispersed in the n-layer and comprises a second salt.

Claim 20 (original): The method of claim 19, wherein the first salt comprises glycerol-2-phosphate, sodium salt and the second salt comprises triethanoloamine quaternized with 1-bromobutane.

Claim 21 (currently amended): The method of claim 17, further comprising prior to the binding of the p-layer and the n-layer, expelling a plurality of a first mobile ion produced during the p-layer forming from the p-layer and a plurality of a second mobile ion produced during the n-layer forming from the n-layer to set [[a]] an interfacial potential of the p-n heterojunction interface.

Claim 22 (original): The method of claim 17, further comprising during the binding of the p-layer and the n-layer, removing at least a portion of volatile mobile ions generated in the n-layer or the p-layer.

Claim 23 (original): The method of claim 22, wherein the removing of the volatile mobile ions is performed under reverse electrical bias.

Claim 24 (original): The method of claim 17, wherein the p-layer has a thickness of less than about 250 nm and the n-layer has a thickness of less than about 250 nm.

Claim 25 (previously presented): The method of claim 24, wherein the p-type semiconductor organic nanocrystals comprise titanyl phthalocyanine (TiOPc) and the n-type semiconductor organic nanocrystals comprise perylene-bis-2-pyridylethylimide (PPyEI) each having a size less than about 150 nm.

Claim 26 (currently amended): The method of claim 17, wherein the binding matrices comprise epoxy and the binding of the p-layer and the n-layer is performed prior to curing of the epoxy.

Claim 27 (original): The method of claim 17, further comprising providing a first electrically conductive substrate abutting the p-layer on a side opposite the p-n heterojunction and providing a second electrically conductive substrate abutting the n-layer on a side opposite the p-n heterojunction

Claim 28 (original): The method of claim 17, wherein the p-layer further comprises inorganic nanocrystals of a p-type semiconductor.

Claim 29 (original): The method of claim 17, wherein the n-layer further comprises inorganic nanocrystals of an n-type semiconductor.

Claim 30 (original): The method of claim 17, further comprising after the binding, dehydrating the bound p-layer and n-layer in a vacuum oven at a raised temperature.

Claim 31 (original): The method of claim 17, wherein the binding matrix of the p-layer comprises the anion additive or the binding matrix of the n-layer comprises the cation additive.

Claim 32 (original): The method of claim 17, wherein the anion additive is incorporated into the p-type semiconductor organic nanocrystals or the cation additive is incorporated into the n-type semiconductor organic nanocrystals.

Claim 33 (original): A power window comprising a cell formed by the method of claim 17, wherein the p-type semiconductor organic nanocrystals, the n-type semiconductor organic nanocrystals, the binding matrices, the anion additive, and the cation additive are substantially transparent.